

I. **REMARKS**

Claims 1-10 are pending. No amendments to the specification or claims are made at this time. Applicants respectfully request reconsideration of present claims 1-10.

Claims 1-10 are rejected under 35 U.S.C. § 112, first paragraph, for insufficient written description. This rejection is traversed.

Further to the remarks in Applicants' Responses filed October 12, 2006 and November 9, 2006, Applicants respectfully maintain that specification provides sufficient written description to support the presently claimed invention.

As previously noted, present claim 1 discloses "substituting CFC 11 in its entirety with azeotropic or near azeotropic foaming agents compositions" and claim 9 discloses "the substitution of CFC-11 in its entirety with foaming agent azeotropic or near azeotropic compositions." Meanwhile, Table 14 on page 33 of the specification shows that the compositions of the presently claimed invention (e.g., the foaming compositions of example  $\gamma$  and example  $\delta$ ) behave in the same way as the foaming composition containing CFC 11 (example  $\alpha$  comparative), since they give a foam density equal (example  $\gamma$ ) or substantially the same (example  $\delta$ ) to that given by the composition with CFC 11, and the foam appearance is the same for all of the tested compositions. See Table A. Further, page 34 and Table 14 of the specification disclose that "[s]ufficiently low densities (about 30 Kg/m<sup>3</sup>) are obtained with amounts of fluorinated foaming agent and water comparable with the amounts used in the reference formulations with CFC 11" (emphasis added).

The Applicants have already shown that, by calculating the % by weight of the components of each of the above compositions, the amount of the components of examples  $\gamma$  and  $\delta$  are comparable and are also very similar to that of example  $\alpha$  comparative. In fact, any variation in the amounts of the components is not more than 1-2% of the total composition. Therefore, if the polyurethane foams have about the same density when the starting compositions are comparable, as discussed above, those of skill in the art would have understood that the starting formulations having the same composition would result in similar or equal foam densities.

Regarding the foam density of 30 Kg/m<sup>3</sup> in particular, Applicants note that this value may be used for polyurethane foams. Therefore, this foam density is of industrial interest. In fact, in the foaming field, low density polyurethane foams are generally preferred.

As such, page 34 of the specification sufficiently indicates that the blowing agent compositions of present claim 1 can substitute for CFC 11. See also, page 2, lines 1-3 and the last paragraph on page 19 of the specification.

Further, as the Examiner notes that the quantities of the components are not exactly the same in the examples on page 33, Applicants enclose a Declaration comparing the presently claimed invention with a formulation of CFC 11 using the same amounts of each component. In particular, the following foaming agent mixture according to the presently claimed invention was used:

HCF<sub>2</sub>OCF<sub>2</sub>OCF<sub>2</sub>H (HFPE1) /HFC 365mfc in a ratio of 60/40 (% by weight)

The quantity of the composition of the presently claimed invention, in molar amount, was the same as that of CFC 11 in Example  $\alpha$  comparative. The quantities by weight of the other components were also the same.

In particular, the molar amount of the blowing agents of the foaming composition of example  $\alpha$  comparative and Test A are the same in the comparative test of the Declaration since the compounds are used in their gaseous form. Therefore, the foam density is in direct relationship with the gas moles, which must be the same in order to have the same gas volume, as known to those of skill in the art. The molar amount of CFC 11 was calculated from the corresponding molecular weight of 137.5 to be 0.218 moles (30 g of CFC 11 divided by 137.5 = 0.218 moles). In order to calculate the grams of the foaming agent mixture HFPE1/HFC 36mfc to be added for the experiment of the Declaration, the average molecular weight of the mixture was calculated with the following formula:

$$184 (= \text{m.w. HFPE1}) \times 0.6 + 148 (= \text{m.w. HFC 365mfc}) \times 0.4$$

The average molecular weight was 169.6, which was multiplied by 0.218 to give 36.97 g of the mixture HFPE1/HFC 365mfc 60/40 (i.e., the figure reported under Test A in Table B of the Declaration).

The Declaration shows that, under the same conditions with additives in the same weight quantity and foaming agents (i.e., CFC 11 and HFPE1/HFC 365mfc 60/40) in the same molar amount, the foam density given by the polyurethane foaming composition of the presently claimed invention is not significantly different from that given by the composition of example  $\alpha$  comparative. In fact, the value of the foam density for the

composition of Test A differs only by 0.3% from the composition of CFC 11, which is within the experimental error. Therefore, Applicants respectfully submit that the Declaration demonstrates that the compositions of the presently claimed invention can be used as substitutes for CFC 11.

Applicants also submit that the specification provides support for formulations having densities of other than 30 Kg/m<sup>3</sup>. For example, Applicants submit that by using formulations of CFC 11 and of HFPE1/HFC 365mfc 60/40 having the same compositions, but different amounts of additive and blowing agent, the foam density obtained with the formulation will be still the same in both cases. This is because the critical factor to obtain the same volume, when the other components are in the same quantities, is the moles of the blowing agents. When the moles of the blowing agents in each composition are the same, the volume will be the same, as it is ruled by the gas law. However, as Applicants have already demonstrated this in the enclosed Declaration, Applicants submit that additional demonstrations for other formulations showing different densities are not necessary to overcome this rejection. As such, Applicants submit that the experimental results provided in the specification and in the enclosed Declaration provide sufficient support for the presently claimed invention and, in particular, support the use of the foaming agent mixture of the presently claimed invention as a substitute for the same molar amount of CFC 11. Further, Applicants submit that the term "substitute" was clearly demonstrated by the previously filed remarks to mean "to put or use in place of another. "

For at least the above reasons and further to the previously filed remarks, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-10 under 35 U.S.C. § 112, first paragraph, for insufficient written description.

Claims 1-4, 9 and 10 are rejected under 35 U.S.C. § 102(b) as being anticipated by Klug et al. (U.S. Patent Nos. 5,605,882, 5,648,016, and 5,779,931). This rejection is again traversed.

Further to the previously filed remarks distinguishing the patents to Klug et al. from the presently claimed invention, Applicants respectfully maintain that the cited patents to Klug et al. do not disclose compositions comprising "(IV) difluoromethoxy bis(difluoromethyl ether)  $\text{HCF}_2\text{OCF}_2\text{OCF}_2\text{H}$  and 1,1,1,3,3-pentafluorobutane" or "(V) difluoromethoxy bis(difluoromethyl ether)  $\text{HCF}_2\text{OCF}_2\text{OCF}_2\text{H}$  and 1,1,1,4,4,4-hexafluorobutane" (claims 1 and 9) (emphasis added). Applicants again note that Klug et al. does not disclose hydrofluorocarbons (HFC) 365mfc and HFC 356 ffa. In fact, page 5 of the Office Action indicates that "patentees [Klug et al.] fail to specifically exemplify applicants' claimed component species" (emphasis added). As such, compositions IV and V are novel over the disclosure of Klug et al. Further, Applicants submit that there is no explanation in the Office Action of how those of skill in the art would have been directed to obtain compositions (IV) and (V) from the disclosure of Klug et al. The Examiner is again requested to clarify how those of skill in the art would have been able to envisage the presently claimed invention from Klug et al.

Applicants also respectfully submit that Klug et al. does not teach or suggest a process for foaming polyurethanes, wherein CFC 11 is substituted with the foaming agent

compositions of present claim 1. As such, Applicants respectfully submit that the process of present claim 1 is novel over Klug et al. In particular, Applicants submit that those of skill in the art would not have thought to use the azeotropic or near azeotropic compositions of Klug et al. as viable replacement for virtually any conventional blowing agent for polyurethane foams, including CFC 11. As demonstrated by the previously filed Declaration of Dr. Basile, azeotropic compositions of Klug et al. have been shown not to work as blowing agents for polyurethane foams. As such, those of skill in the art would not have been motivated to modify the disclosed compositions of Klug et al., much less to obtain viable substitutes of CFC 11 as claimed in the process of claim 1.

Applicants also note that the technical problem of the presently claimed invention requires that the azeotropic compositions be tested as blowing agents under the same conditions used for CFC 11, which include the experimental conditions to obtain the foam and the other conditions on the compositions. The previously filed Declaration of Dr. Basile shows that under the conditions used for obtaining polyurethane foams using CFC 11, 5 out of the 7 tested composition of Klug et al. did partially expand or did not expand at all. While it may be possible to obtain fully expanded foams using other experimental conditions with the blowing agents of Klug et al., such conditions would be different from those that provide fully expanded foams from CFC 11 polyurethane foaming compositions. However, with the different conditions being required, the blowing agent compositions of Klug et al. cannot clearly be used as substitutes of CFC 11 as in the presently claimed invention.

As Klug et al. does not disclose each and every element of independent claims 1 and 9, Applicants submit that Klug et al. does not anticipate these claims. Dependent claims 2-4 and 10 are patentable for at least the same reasons. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-4, 9, and 10 under 35 U.S.C. § 102(b) over Klug et al.

Claims 1-4, 9 and 10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Klug et al. This rejection is again traversed.

Further to the remarks above and the previously filed remarks, Applicants respectfully maintain that the particular combinations of compositions (IV) and (V) of claims 1 and 9 would not have been obvious over the broad disclosure of Klug et al., much less that these blowing mixtures could be substituted for CFC 11, and therefore solve the technical problem of the presently claimed invention. Applicants again note that in the previously filed Declaration of Dr. Basile, the tested compositions (see Table 1) contained the same amount of polyol polyether, water aminic catalyst and isocyanate as the composition of example  $\gamma$  according to Table 14 of the Specification. Further, the tested compositions contained the same amount on a molar basis of the HFPE1/HFC 365 mfc mixture of the example. As such, this Declaration shows that no composition among those tested (7 different azeotropic compositions taken from the list of Table 1 of Klug et al.), when expanded under the same conditions reported at page 32 of the specification (the same conditions used for obtaining polyurethane foams of CFC 11) gave a foam having the same property of that obtained with the composition of example  $\gamma$ . It is therefore unexpected that the blowing agent compositions of the presently claimed

invention could work as substitute for CFC 11 in foaming polyurethane compositions utilizing CFC 11. The Declaration of Dr. Basile thus demonstrates that polyurethane foams according to the teachings of Klug et al. do not teach or suggest the substitution of CFC 11 in processes for making polyurethane foams. The solution found by the Applicants is even more unexpected since Klug et al. does not disclose HFC 365mfc or HFC 356 ffa, much less PFPE1 in combination with these hydrofluorocarbons to solve the technical problem of the presently claimed invention.

As to the assertion in the Office Action that controlling the density of the foam to arrive at a certain specific density value amounts only to control or optimization of result effective variables, Applicants note that the term "optimization" means "an act, process or methodology of making something ... as fully perfect, functional or effective as possible" (see the enclosed page 829 of the book "Webster Ninth New Collegiate Dictionary"). Therefore, the act of optimization is necessarily based on something that is already known, that must be in fact made, as recited in the above reference, as fully perfect, functional or effective as possible. In the present application, the composition to be optimized is not taught or suggested by the disclosure of Klug et al. In fact, the claimed compositions have been found by the experimental work performed by the Applicants. As such, optimization by those of skill in the art could not have resulted in the presently claimed invention.

As Klug et al. do not teach or suggest all of the elements of the claims 1-4, 9 and 10, Applicants again submit that these claims would not have been obvious to those of skill in the art over the disclosures of the cited patents to Klug et al., alone or in



combination. As such, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-4, 9 and 10 under 35 U.S.C. § 103(a) as being unpatentable over Klug et al.

Claims 5-7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Klug et al. in view of Barthelemey et al. (U.S. Patent No. 5,304,320). This rejection is traversed.

Please see the above discussion distinguishing claim 1 from the cited patents to Klug et al. As claims 5-7 are dependent upon claim 1, Applicants submit that claims 5-7 are patentable for at least the same reasons as claim 1.

Further, Applicants respectfully maintain that Barthelemy et al. does not satisfy the deficiencies of the cited patents to Klug et al. Please see Applicants' previously remarks distinguishing Barthelemy et al.

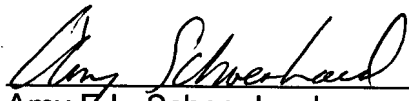
As the cited references do not teach or suggest all of the elements of claims 5-7, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 5-7 under 35 U.S.C. § 103(a) over the cited patents to Klug et al. in view of Barthelemy et al.

## II. Conclusion

Applicants respectfully submit that this application is in condition for allowance and such action is earnestly solicited. If the Examiner believes that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below to schedule a personal or telephone interview to discuss any remaining issues.

In the event that this paper is not being timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to Counsel's Deposit Account Number 01-2300, referencing Docket Number 108910-00123.

Respectfully submitted,

  
\_\_\_\_\_  
Amy E.L. Schoenhard  
Registration Number 46,512

Customer Number 004372  
ARENT FOX LLP  
1050 Connecticut Avenue, NW, Suite 400  
Washington, DC 20036-5339  
Telephone: 202-857-6000  
Fax: 202-857-6395

Enclosures: Petition for Extension of Time (one-month)  
Declaration  
Reference (2 pages)